Use of structured self-monitoring of blood glucose improves HbA1c and diabetes-related distress in Australian adults with non-insulin-treated type 2 diabetes: first results from 'STeP IT UP'

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BACKGROUND

- Structured self-monitoring of blood glucose (SMBG) is an approach in which blood glucose data are gathered according to a defined regimen, interpreted and utilised to make appropriate pharmacologic and/or lifestyle adjustments.[1,2]
- Clinical studies have shown that use of structured SMBG:
  - improves glycaemic control[3-5]
  - facilitates more frequent, aggressive therapy intensification[6]
  - reduces depression and diabetes-related distress[7]
  - reduces cardiovascular risk[8,9]
  - enhances patient understanding and engagement[10]
  - improves treatment satisfaction and quality of life[10,11]
  - is cost-effective[3,12]
- Observational studies have demonstrated that use of structured SMBG is both practical and sustainable in real world clinical settings.[13,14]
- Although the benefits of structured SMBG have been demonstrated in several US and European studies, the generalisability of these findings have not yet been shown in Australia.

AIMS

- The aims of the Structured Testing Program Implementation Trial (STeP IT UP) were: to assess the feasibility of implementing the original STeP study protocol in the real world.
- To observe the impact of structured SMBG on HbA1c and diabetes-related distress in adults with non-insulin-treated type 2 diabetes managed in primary care settings across Australia.

METHODS

- This was a 24-week, multi-centre, uncontrolled, observational study.
- 98 adults with non-insulin-treated type 2 diabetes managed in primary care settings across Australia are included in this analysis (Table 1).
- Australian clinicians with structured SMBG experience trained participants to use and interpret structured SMBG (3-day, 7-point profiles), using the Accu-Chek 360 View tool.[3] Using this paper tool, adults with type 2 diabetes record a 7-point SMBG profile (fasting, preprandial/ 2-h postprandial at each meal, bedtime), document meal sizes and energy levels and comment on their SMBG experiences.
- Participants completed the tool prior to their visits at weeks 4, 12 and 24; results were discussed at each visit.
- Assessments of HbA1c levels and blood glucose values were made at weeks 4, 12 and 24.
- Blood glucose values were categorised as:
  - Low: <4 mmol/L
  - Within Target: 4-10 mmol/L
  - High: >10 mmol/L
Measurements of diabetes-related distress were taken at baseline and week 24.
- Data at weeks 12 and 24 (last non-baseline value carried forward); data regarding change in HbA1c were available for 98 participants.

Table 1. Participant characteristics at baseline (N=98)

Characteristic	Mean (SD) or N (%)
Age, years	61.9 (11.8)
Gender, female	37 (37.8)
HbA1c, %	8.62 (1.07)
BMI, kg/m2	31.7 (6.3)
Weight, kg	90.6 (19.0)

SD = standard deviation

RESULTS

- Significant reductions in HbA1c from week 4 were seen at weeks 12 and 24 (Figure 1).
- No increases in hypoglycaemia (<4 mmol/L) were seen (Figure 2).
- Significant reductions in the percentage of high blood glucose values (>180 mg/dL / >10 mmol/L) were seen at weeks 12 and 24 (Figure 3).
- Significant increases in the percentage of blood glucose values within target range (4-10 mmol/L) were seen at weeks 12 and 24 (Figure 4).
- Diabetes-related distress decreased slightly from baseline (2.09 [1.01]) to week 12 (1.75[0.74], Δ -0.16[0.74], p=0.061) and reached significance by week 24 (1.69[0.83], Δ -0.22[0.83], p=0.023).

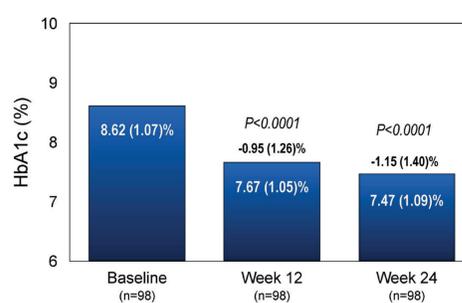Figure 1. Change in HbA1c from baseline to Weeks 12 and 24

Figure 2. Change in Percentage of Low Blood Glucose Values (<4 mmol/L) from baseline to Weeks 12 and 24 (Profile Days)
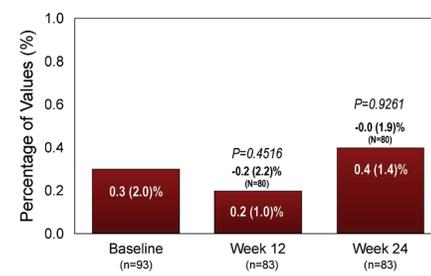

Figure 3. Change in Percentage of High Blood Glucose Values (>10 mmol/L) from baseline to Weeks 12 and 24 (Profile Days)
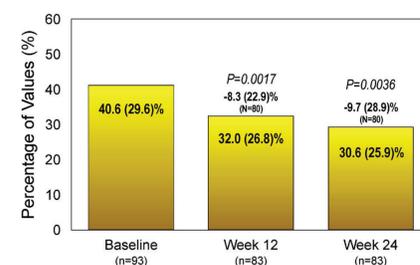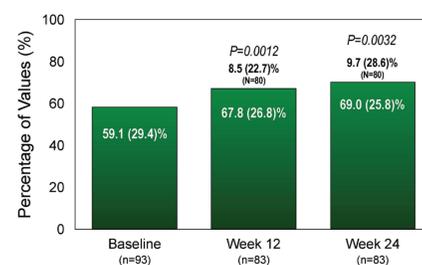

Figure 4. Change in Percentage of Blood Glucose Values Within Target Range (4-10 mmol/L) from baseline to Weeks 12 and 24 (Profile Days)

CONCLUSIONS

- We confirmed the transferability of the STeP Study protocol to real life primary care practice in Australia.
- In this analysis of an observational study, use of structured SMBG by Australian adults with non-insulin-treated type 2 diabetes, supported by primary care clinicians, is associated with significant improvements in glycaemic control without increasing hypoglycaemia.
- Over time, it appears that diabetes-related distress also decreases significantly.
- These findings support evidence already gathered from US and European studies, indicating that structured SMBG can improve both biomedical and psychological outcomes for adults with non-insulin-treated type 2 diabetes.

Enquiries

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The Accu-Chek 360 View tool is available from: www.accu-chek.com.au.

Acknowledgements

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